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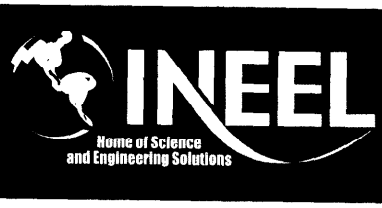
Data Management Plan for Field and Nonchemical Data from the Operable Unit 3-13, Group 6, Buried Gas Cylinders



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ABSTRACT

This *Data Management Plan* describes the capture and maintenance of all the field and nonchemical analytical data generated during remedial activities at Group 6, Operable Unit 3-13. Group 6 consists of two sites, CPP-84 and CPP-94. This plan includes data generated during post-removal soil sampling at CPP-94 and cylinder removal and soil sampling at CPP-84. Types of data managed by this plan include sampling information, cylinder classification, cylinder gas identification, observations, calibration, and surveying.

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ACRONYMS

AR/IR	Administrative Records and Information Repository
ARDC	Administrative Records and Document Control
BBWI	Bechtel BWXT Idaho, LLC
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	chain of custody
COPC	contaminants of potential concern
CPP	(Idaho) Chemical Processing Plant
DMP	data management plan
DOE	U.S. Department of Energy
DQO	data quality objective
ER	Environmental Restoration (Program)
ER/DC&RM	Environmental Restoration Document Control and Records Management
ER-DMP	Data Management Plan for Idaho National Engineering Laboratory Environmental Restoration Program
ERIS	Environmental Restoration Information System
EROIS	Environmental Restoration Optical Imaging System
ERPC	Environmental Restoration Program Coordination
FFA/CO	Federal Facility Agreement and Consent Order
FSP	field sampling plan
GIS	geographical information system
HASP	health and safety plan
IEDMS	Integrated Environmental Data Management System

INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology Engineering Center
MCP	management control procedure
OU	operable unit
QA/QC	quality assurance/quality control
QAPjP	quality assurance project plan
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SMO	Sample Management Office
WAG	waste area group

Data Management Plan for Field and Nonchemical Data from the Operable Unit 3-13, Group 6, Buried Gas Cylinders

1. INTRODUCTION

The Idaho National Engineering and Environmental Laboratory (INEEL) is divided into 10 waste area groups (WAGs) to better manage environmental operations mandated under a *Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991). The Idaho Nuclear Technology and Engineering Center (INTEC), formerly the Idaho Chemical Processing Plant (CPP), is designated as WAG 3. Operable Unit (OU) 3-13 encompasses the entire INTEC facility and was investigated to identify potential contaminant releases and exposure pathways to the environment from individual sites as well as the cumulative effects of related sites. Ninety-nine release sites were identified in the *OU 3-13 Remedial Investigation/Feasibility Study* (RI/FS), 46 of which pose a potential risk to human health or the environment (Rodriguez 1997). The 46 sites were divided into seven groups based on similar media, contaminants of concern, accessibility, or geographic proximity. The *OU 3-13 Record of Decision* (ROD) (DOE-ID 1999) identifies remedial design/remedial action (RD/RA) objectives for each of the seven groups. The seven groups are as follows:

- Group 1 - Tank Farm Soil
- Group 2 - Soil Under Buildings and Structures
- Group 3 - Other Surface Soil
- Group 4 - Perched Water
- Group 5 - Snake River Plain Aquifer
- Group 6 - Buried Gas Cylinders
- Group 7 - SFE-20 Hot Waste Tank System.

This *Data Management Plan* (DMP) has been prepared for the U.S. Department of Energy (DOE) to describe the capture (manual and electronic) and maintenance of all field and nonchemical analytical data generated in support of the WAG 3 OU 3-13 Groups 6 RD/RA activities. This DMP, one of two data management plans, covers field-generated and nonchemical analytical data. The second plan, the *Data Management Plan for Idaho National Engineering Laboratory Environmental Restoration Program* (ER-DMP) (DOE-ID 1995), covers data management for the Environmental Restoration (ER) Program, and specifically addresses chemical analytical data (i.e., sample results). Data covered by this plan include excavation detail, measurement, magnetometer surveys, air monitoring, observation, instrument calibration, and cylinder information recorded during OU 3-13 Group 6 field activities. This DMP also covers nonchemical analytical data (i.e., cylinder classification). Table 1-1 lists the types of data covered by this DMP and examples of each type of data. If additional data, other than the examples provided in Table 1-1 is generated during the course of the project, it will be managed in accordance with this DMP as well. The management of chemical analytical data is detailed in the ER-DMP.

Table 1-1. Data covered by this *Data Management Plan.*

Data Type	Collecting Organization	Data Examples
Excavation details	Bechtel BWXT Idaho, LLC (BBWI) personnel	Daily reports and status, obstacles, inspections, soil and fill description
Survey data	BBWI personnel	Excavation
Cylinder locations	BBWI personnel	Location found, location racked
Cylinder classification	BBWI personnel	Flammability, valve conditions, cylinder integrity, preliminary gas identification
Cylinder sampling	BBWI personnel	Cylinder ID, sample ID, gas identification
Soil sampling	BBWI personnel	Excavation bottom, spoil piles
Magnetometer surveys	BBWI personnel	Positive/negative instrument response
Physical probing	BBWI personnel	Hit or miss

The scope of this DMP includes the following:

- Data flow, data custodianship, and storage
- Organizational and individual responsibilities associated with data management
- Protocol for unique identification of files.

1.1 Objectives

The principal objective of data management is to provide consistent and rapid access to accurate, validated data useful to those making decisions about remedial actions. Specific data management objectives for this project are as follows:

- Ensure that uncorrupted field data are transferred to a permanent, long-term, easily accessed data storage system
- Track and organize all nonchemical data pertaining to field samples and associated geotechnical analyses
- Ensure that the description of each data point is meaningful and complete
- Ensure that large volumes of data can be efficiently managed
- Ensure that each data point is accurate and readily accessible.

Laboratory chemical analyses of field samples will be arranged through the INEEL Sample Management Office (SMO). Data generated from these analyses are subject to the data management requirements imposed by the SMO and are detailed in the ER-DMP.

2. DATA MANAGEMENT AND FLOW

The structure of various groups responsible for data management is outlined below. ER personnel, particularly the project manager, are primarily responsible for managing the project data. The system for the organized flow of both field hardcopy data and digital information generated during the OU 3-13 Group 6 field activities is also described below.

The following information applies only to field data. The flow of chemical laboratory data (i.e., sample analysis for contaminants of concern) is controlled through the INEEL SMO. Management and flow of chemical analysis data are covered in the ER-DMP, company procedures, and SMO procedures.

2.1 Data Management Organization and Responsibilities

Responsibilities for data management lie primarily with Environmental Restoration Program Coordination (ERPC). ERPC is responsible for maintenance and operation of the following electronic systems: the Administrative Records and Information Repository (AR/IR), the Environmental Restoration Document Control and Records Management system (ER/DC&RM), the Environmental Restoration Information System (ERIS), and the Environmental Restoration Optical Imaging System (EROIS). The Integrated Environmental Data Management System (IEDMS) also supports data management. Specific responsibilities of each organization involved in data management are detailed in Section 3.1.2 of the ER-DMP. The following subsections summarize each of the previously mentioned systems.

2.1.1 Administrative Records and Document Control

The AR/IR is a combination of two duties. One is the maintenance and indexing of documents related to ER activities under the FFA/CO and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process accessible to the public as required under the CERCLA (the AR portion). The other duty is the maintenance and indexing of documents, related to any ER activity, that are accessible to the public (the IR portion). Specific management control procedures (MCPs) and program directives detail which data are to be forwarded to the AR/IR for inclusion in the files.

2.1.2 Environmental Restoration Document Control and Records Management

The ER/DC&RM combines the issuance of documents and the maintenance of project files for ER activities. Company procedures detail what data are to be forwarded to the ER/DC&RM for inclusion in the project files. The ER/DC&RM covers those documents that detail ER activities but do not meet the criteria of administrative records.

2.1.3 Integrated Environmental Data Management System

The IEDMS is a personal-computer-based data management system that supports ER activities. The system provides data management functions for ER activities, starting with the assignment of unique sample identification numbers through validation of results and upload of validated data into ERIS. The system is not designed for end-user access, but serves as a front-end system to ERIS.

2.1.4 Environmental Restoration Information System

ERIS is a data repository for chemical and other attribute information about waste sites at the INEEL. ERIS has three main components: (1) an Oracle-based database management system, (2) a

geographical information system (GIS), and (3) scientific visualization capabilities. The ERIS electronically stores, retrieves, and analyzes validated data for ER decisionmaking.

2.1.5 Optical Imaging System

Through optical imaging, hard-copy documents can be stored electronically, including images of signatures, photos, and other document contents that cannot be electronically captured by other means. The OIS, the electronic version of the AR/IR, supports the ER program information repository and project files. Hard-copy documents related to specific ER projects can be stored online and readily retrieved. ERPC personnel maintain security and control of the OIS to protect against document loss and unauthorized access.

2.2 Data Flow

Figure 2-1 is a flow chart of the data management system. This DMP covers the flow of field data as shown in Column 4. Chemical analytical data follow the paths in Columns 2 and 3. Either before or immediately after field activities, sample locations are surveyed, and coordinate information is uploaded to a temporary survey database on the IEDMS. Once loaded onto the IEDMS, soil boring and surface soil sample information is verified and validated for accuracy and field changes. Information from sampling forms such as the chain of custody (CoC) form and the analytical request is stored in the database for tracking purposes. Field characterization samples are sent to a project-specific laboratory for analysis. Verification and confirmation samples, as well as any composite samples, are sent to off-Site laboratories for analysis. Analytical results are uploaded into the results database. Validated data files are uploaded to the ERIS, from which GIS maps may be generated.

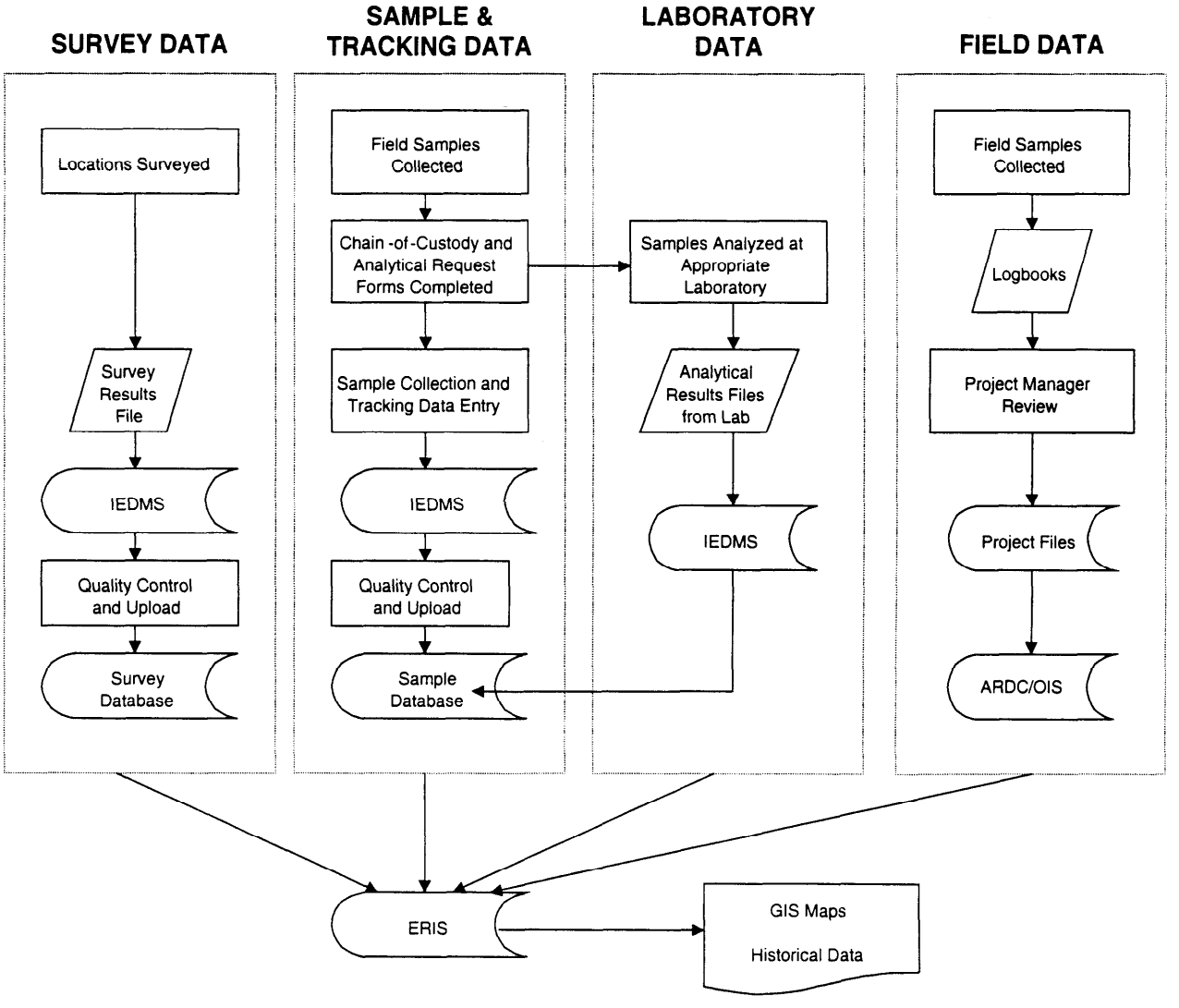

Figure 2-1. Data management system flow chart.

3. DATA QUALITY ASSURANCE OBJECTIVES

The primary means of assuring the quality of data is through the use of the data quality objective process (DQO) (EPA 1994). The DQO process is a systematic procedure for defining data collection criteria based on the scientific method. The project DQOs specify the quality of the data required to support a decision. The level of detail and data quality needed to produce a decision varies based on the intended use of the data. The goal is to obtain data of appropriate quality for the intended use in an efficient and cost-effective manner. This section outlines the data management activities integral to the success of the DQO process.

The DQOs for Group 6 are detailed in Section 3.2 of DOE-ID (2001).

3.1 Soil Sampling and Analysis

Preliminary sampling and analysis planning is detailed in (DOE-ID 2000). This plan lists the contaminants of potential concern (COPC) and the associated sampling and analysis methods. Data collection occurs in pre-removal and post-removal phases. Soil samples will be collected and analyzed for COPCs at an off-Site laboratory.

3.2 Field Data

Field data generated during this project will consist of field and calibration logbooks, magnetometer surveys, physical probing, visual and physical examinations of the excavation and cylinders, air monitoring, radiological monitoring, cylinder contents, and miscellaneous cylinder information. All data will be maintained within the project file. After the project is complete, the file is sent to the ER/DC&RM.

3.3 Analytical Data

For this project, analytical data are separated into chemical and nonchemical analyses. Chemical analytical data is tracked and maintained by the INEEL SMO as detailed in the ER-DMP. Nonchemical analytical data could be items such as magnetometer surveys. Hard copy of this information will normally be transmitted to the project manager. Original documents are maintained with the project file.

4. FIELD ACTIVITIES

During any portion of a project, consistent documentation and recordkeeping procedures are critical because future decisions will be based on data gathered during previous sampling activities. Field activities will adhere to approved planning documents and field procedures. Field activities include activities such as excavation, cylinder removal, cylinder sampling, cylinder gas treatment, and empty cylinder storage and disposal; and soil sampling. Data from excavation; cylinder removal, sampling, and treatment; and waste management are recorded in field activity logbooks. Data from cylinder and soil sampling activities are recorded in sampling/shipping logbooks.

All original data collected in the field will be retained in accordance with Section 20.2 of DOE/ID (1991), DOE Order 200.1, and any other contractor document requirements (e.g., MCPs). All data will be recorded with waterproof ink and forwarded to the ARDC as part of the project file. When data are loaded directly onto a personal computer (e.g., cylinder gas analysis files in the field), the data storage media are considered a record and must be treated as such. DOE Order 200.1 provides guidance on the transfer of electronic data. Data must be forwarded to both the ARDC and ERIS.

4.1 Planning Documentation

ER field activities must adhere to requirements specified in approved documents such as work plans, field sampling plans (FSP) quality assurance project plans (QAPjP), and health and safety plans (HASP). All documents produced specify the appropriate document management for the data anticipated to be generated. Documents such as the QAPjP and the FSP describe which of the project records are quality records and describe how quality records are to be managed.

4.2 Data Security System

Data security measures help ensure that critical data are not lost, destroyed, or altered. Measures include issuing controlled logbooks, periodically duplicating logbooks, and using CoC forms. The field team leader controls access to logbooks during the field portion of a project. Before and after fieldwork, the project manager or his designee controls the logbook.

4.3 Field Logs

Field logbooks contain records of all activities related to onsite field actions. Personnel involved in the field sampling and measurement (e.g., field team lead) maintain the field logbooks. Data recorded in field logbooks can include information on samples collected, measurements taken (e.g., cylinder locations in landfill), and observations on events or conditions that could affect the quality of the data. Using logbook data, people should be able to reconstruct events that occurred during the sample and data collection, so logbook entries should be thorough enough to allow such reconstruction. At a minimum, a field logbook should contain the following information:

- Modifications to activities or procedures described in the planning documents (e.g., FSP, QAPjP, HASP)
- Justification for such modifications
- Field measurements and observations
- Weather conditions

- Unusual occurrences or circumstances
- Any audit findings and corrective actions implemented as a result of such findings.

All entries must be signed and dated, and all changes must be legible. Changes are made by drawing a single line through the incorrect information and signing and dating the change

Logbooks are issued to specified personnel who are then responsible for security and return of logbooks at the conclusion of the project. Original logbooks will become part of the project records and will be maintained in the ARDC.

4.4 Calibration and Maintenance Logs

Calibration and maintenance logs are records of all calibration and maintenance activities performed on equipment used for onsite field actions. Calibration and maintenance logs may be maintained by personnel involved in the field sampling and measurement (e.g., field team leader, sample team lead) or by the group who issues the instrument (i.e., Radiation Control). Data recorded in calibration and maintenance logbooks should include information on the last date of calibration or maintenance, details of the method used for calibration, maintenance performed, and any observations or conditions that could affect the operation of the instrument or quality of the resulting data. These logbooks are intended to contain sufficient information and observations to enable participants to reconstruct events that occurred during the sample/data collection.

All entries must be signed and dated, and all changes must be legible. Changes are made by drawing a single line through the incorrect information and signing and dating the change.

Logbooks are issued to specified personnel who are then responsible for security and return of logbooks at the conclusion of the project. Original logbooks will become part of the project records and will be maintained as such in the ER/DC&RM.

4.5 Chain of Custody

Chain of custody forms are records of the collection, possession, and transfer of a sample. A completed CoC form is a record showing that sample integrity has been maintained from the time a sample is collected through final analysis. The CoC form may also be used to specify the required analysis, test methods, and to note comments. It is incumbent on the project manager, normally through the field team leader, to ensure that proper CoC documentation is completed for each sample case. Data cannot be validated without proper, complete CoC protocols. The INEEL has procedures that have instructions about the proper use and completion of CoC records.

4.6 Survey Data

Because remedial action decisions are based on spatial and depth data, accurate survey information is crucial. Sampling locations, as described in Section 3 of the *Characterization Plan* (DOE-ID 2000), are laid out and marked by a licensed surveyor. Surveyors will supply northing, easting, and surface elevation data in electronic format for upload into the ERIS GIS. Each location is referenced to the state of Idaho datum grid system, and surface elevation is measured to the nearest hundredth of a foot. Immediately following field intrusive activities such as excavation, the actual sampling locations are surveyed. This survey may be by either stick and chain or with a global positioning system unit. By

tying sampling data to a known location, the GIS can be used as an analytical tool for mapping concentrations and for spatial analysis.

The following survey information is maintained:

- *Sample Location* - Unique identifier for a sampling location. The convention to be used for this project is yet to be determined.
- *Northing* – State of Idaho datum northing coordinate.
- *Easting* - State of Idaho datum easting coordinate.
- *Surface Elevation* - Elevation of sample location at ground surface above mean sea level.

4.7 Field Data

Field data are captured into the data management system through manual data entry or from electronic format diskettes. Data from sampling forms, CoC forms, and field logbooks are scanned into the OIS database. From there it is directly accessible through the ER/DC&RM, and may be uploaded to the ERIS.

Field data include but are not limited to the following:

- Field team leader logbook
- Sample team logbook
- Calibration and maintenance logbook(s).

Samples may be analyzed at a project-specific on-Site (INEEL) laboratory and/or off-Site laboratory. Laboratories will supply information about each analysis for each sample in a consistent, electronic format.

4.8 Laboratory Data

For this project, laboratory data are separated into chemical and nonchemical analyses. Chemical analytical data are managed by the SMO, as detailed in the ER-DMP, and are uploaded into the ERIS database after validation and verification. Nonchemical data (e.g., cylinder properties, cylinder content) are maintained with the project file until project completion. This information will normally be transmitted to the project manager in hard-copy form. Original documents are maintained with the project file until project completion and are then transferred to the ER/DC&RM.

5. DATA MANAGEMENT AND TRACKING

Data consistency is of utmost importance for spatial and statistical analyses. To promote consistency, standard codes for relevant data fields are developed and distributed to field personnel prior to sampling. For soil samples, this system is described in Section 4.2 of the *Characterization Plan* (DOE-ID 2000). Codes for cylinders begin with the site number and are followed by a three-digit number (e.g., CPP-84-012). Examples of these fields include analyses requested, container types and volumes, and field quality assurance/quality control (QA/QC) sample types. Field personnel are required to use these codes when completing CoC and analytical request forms.

As field personnel collect samples, they record data in the field sampling logbook and complete CoC forms and analytical request forms. Samples are prepared for hand delivery to the on-Site laboratory or shipment to an off-Site laboratory. Shipping information is recorded in the sampling/shipping logbook. Information for samples going to SMO-approved laboratories is entered into the IEDMS database for tracking purposes. Additional analysis information, supplied by the laboratories when results are returned, is also maintained.

5.1 Characterization Plan

To accurately determine the effectiveness of a remedial action, quantitative sample and analysis data must be collected from key locations. Information on these key locations, sampling, and analysis are included in a characterization plan. The characterization plan consists of two basic parts: a field sampling plan and a quality assurance project plan. The characterization includes project-specific DQOs and requirements for sample and data collection and analysis activities.

5.2 Sample Identification Code

A 10-character identification code as detailed in Section 4.2 of the applicable *Characterization Plan* (DOE-ID 2000) will be used for most soil samples in this project. Alternative sample identification codes may be used as deemed necessary. The use of unique sample identification is crucial to keep data from different locations from becoming mixed. Codes for cylinders will consist of the site number, CPP-84, and a three-digit number (e.g., CPP-84-012).

6. DATA REDUCTION AND PRESENTATION

Sampling data are used for different purposes. Data from the permanent databases (ERIS) can be extracted for use in making remedial action decisions, calculating summary statistics, and preparing interim data reports and the implementation report. When appropriate, data will be reported with statistically supported uncertainty limits.

Data reduction is the process of taking raw data and applying any necessary calculations to arrive at the value of interest. Examples include such things as determining the percent moisture content and many hydraulic parameters.

Field data will not require any data reduction since they will be collected as direct measurements. Data reduction for both chemical and nonchemical analytical laboratories will be addressed in the project-specific task order statements prepared by the SMO.

This project will likely produce a large quantity of data. The data will need to be sorted, manipulated, analyzed, and reported so that the data can be presented as concise, clear, logical information. Data may be presented as text, a table, or as a graphic.

6.1 Data Presented as Tables and Text

Tabular data presentations may include the following:

- Raw (unsorted) data
- Cylinder condition
- Results for each medium or constituent sampled
- Data sorted by stratification factors (i.e., depth-dependent data)
- Summary data.

6.2 Data Presented Graphically

Data that may be presented in graphical form include the following:

- Sampling locations
- Excavation
- Cylinder locations in landfill.

7. DATA REPORTING REQUIREMENTS

Regular reports and documentation are required to keep all project and support personnel and regulatory agencies apprised of project status and progress. Interim and final data report formats will be specified in other project documents.

Minimum laboratory and field analysis reporting requirements are in Section 7.1 of the ER-DMP.

Two types of data files will be transferred to the ARDC and the ERIS for use in generating GIS maps. The minimum information contained in each file is outlined below:

Location File

Sample location code

Surface elevation

Northing

Easting

Sample File

Sample location code

Sample ID

Sample date

Sample type

QC code

Matrix

Depth of sample top

Depth of sample bottom

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